SEGA

# TIC TAC QUIZ

## OPERATION

## and

## SERVICE INFORMATION

SEGA

THE QUARTERMASTER

**Sega of America**

2550 Santa Fe Avenue, Redondo Beach
California 90278 Tel. (213) 772-0833
TWX: 910-325-6228 Cable: Segastar

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# INTRODUCTION

GAME PLAY:

One or two people play TIC-TAC-TOE by responding correctly to our questions displayed on the CRT screen.

2 Players - Either player can start first, then play must alternate.

1 Player - Either X or O can start. Whichever (X or O) starts, plays continuously until there is a winner. A correct response places "his" X or O in place on the screen. An incorrect response places the opposite X or O in the position chosen.

A win is defined as three in a row or five of a kind.

There are 2500 quiz questions stored on each magnetic tape cassette. The questions are randomized on the tape and are called up sequentially.

There are built-in time limits for each customer decision. If the time limit is exceeded, the game will make its' own random decision (in the case of Agree-Disagree, it will be "Wrong". In the case of one-two players, it will be "one player").

Credit or "Free Game" is available if game is over in the specified number or moves. Switch S3 on PCB controls, when or if credit is given.

Position:
0....Never a credit
1....Never a credit
2....Never a credit
3....Win within 3 moves
4....Win within 4 moves
5....Win within 5 moves
6....Win within 6 moves
7....Win within 7 moves
8....Win within 8 moves
9....Always a credit.

There can be only one free game per price of play. Price of play is adjustable via S2 on PCB.

Position:
0....Self Test
1....One coin per game
2....Two coins per game
3....One coin per player
4-9..N/A

## INSTALLATION INSTRUCTIONS

Before plugging machine in, check for any damage which may have occurred during shipping.

With the machine unplugged, open the front and back doors of the Upright Model (unlock and raise table top on Cocktail Model) and check for any internal shipping damage.

Check all connectors to switch units. Logic Board and T.V. Monitor that they are firmly seated.

Inspect Tape Deck Cassette that it is locked in place.

Plug in the machine, defeat the interlock switches by pulling out the activator shaft. At this point the previous game, (X & O's) and Question and Answers should be displayed on the CRT. It should be sharp and exhibit the proper levels of brightness and contrast.

Start a game by inserting a coin and touching 1 or 2 player square.

Check game for proper sequence and that all keyboard switches are working properly.

### TTQ Specifications

Power Requirements — 120 Volts - 60 HZ
Stand By — 150 Watts
Maximum — 150 Watts

Dimensions
Cocktail — Height -29½" - W-30½" - D-30½"
Upright — Height - 60" - W-24" - D-30"

Net Weight
Cocktail — 300 LBS.
Upright — 190 LBS.

Number of Players — 1 or 2

Number of Questions — 2500

Lamps
2 — GE. #912
5 — GE. #194
6 — GE. #904

Fuses

| AMPS | LOCATION | FUNCTION |
|---|---|---|
| 6 | Logic PCB | Table Sign Lamps |
| 4 | Logic PCB | Keyboard Lamps |
| 2—SB | Cabinet Floor | Transformer Primary |
| 3—SB | Cabinet Interlock | Incoming A.C. |
| 5 | At Tape Deck | For Tape Deck |
| (2) 1 | CRT Monitor | For Monitor |

## TTQ SEQUENCE OF EVENTS

MACHINE IN STANDBY
↓
PREVIOUS GAME (X's AND O's) DISPLAYED ON CRT
↓
WINNING GAME FLASHING IN 1 SECOND INTERVALS
↓
PREVIOUS QUESTION, ANSWER AND CORRECT ANSWER DISPLAYED ON CRT
↓
NO SOUND
↓
NO FLASHING LIGHTS

↓

COIN(s) DEPOSITED
↓
ONE AND TWO PLAYER LIGHTS FLASH
↓
ONE OR TWO PLAYER'S SELECTED

↓

X OR O SELECTS FIRST SQUARE THEN PLAY MUST ALTERNATE
↓
SQUARE SELECTED
↓
QUESTION AND ANSWER IS DISPLAYED ON CRT
↓
AGREE—DISAGREE LIGHTS FLASH
↓
AGREE—DISAGREE SELECTED

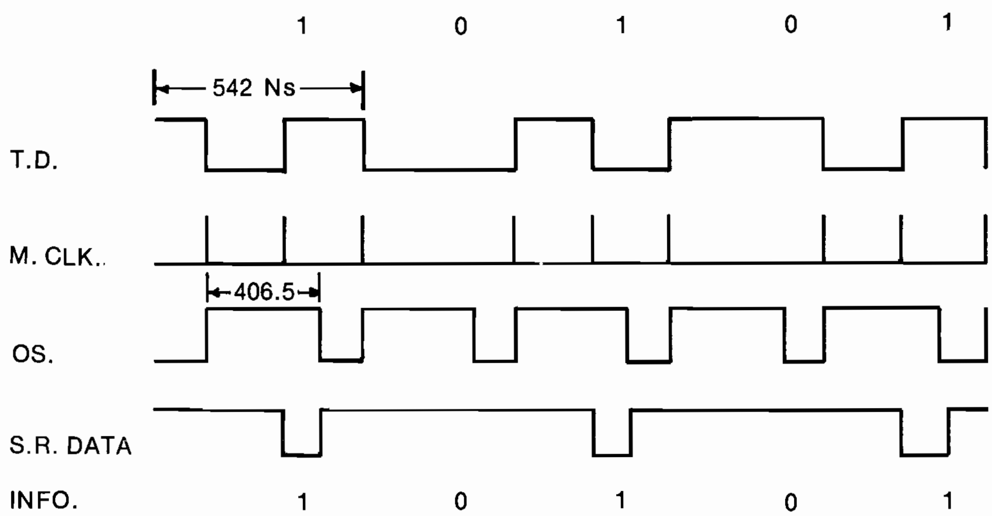
↓

IF CORRECT—PLAYER SELECTING X OR O GETS THE SQUARE,
IF INCORRECT—OPPONENT GETS THE SQUARE
↓
CORRECT ANSWER DISPLAYED ON CRT
↓
PLAY CONTINUES UNTIL WIN
↓
GAME OVER
↓
MACHINE IN STANDBY

## FUNCTIONAL DESCRIPTION OF TTQ GAME:

Tape Deck - The TD is a 12VDC automobile stereo type, that plays in either direction. The unit has no rewind even though it is a reel-to-reel system. The same questions are stored on both channels; if one channel/head malfunctions, the CPU will switch to the other channel automatically. Different questions are on opposite sides of the tape. The information is stored digitally in a manchester format on the magnetic tape.

The Baud rate on the tape is 1844 ± 20%.




The question data block (256 Characters) is stored in RAM for display onto the CRT via the character generator. Therefore, the TD can be turned off in between questions plus prolonging the life of the tape and heads by a magnitude of approximately 20.1.

The computer makes all the game decisions and provides self test. The CPU is looking at the set of switches that must be operated according to the game format:

Coin option; Free Game option; Coin Switch; One Player; Two Player; 9 X Keys; 9 O Keys; Agree; and Disagree.

The CPU controls what switches are enabled, which lights are on, what is being displayed on the CRT Screen and what sounds are activated. X's and O's are stored in their own prom memory and do not come from the main character generator.

The keyboards are Capacitor Touch Plates that change the waveshape on one side of a comparitor for each key. All of the keys for one keyboard have a common oscillator.

The altered wave shape on one side of a comparitor causes an output from this particular comparitor.

SELF TEST - Is selected via S2 on PCB. In this mode, all keys are activated and will cause the appropriate game response directly without entering a coin or actually playing a game.

All X's and O's and all lights and all sounds will be activated in the self test mode via each of the 13/26 keys.

MAJOR COMPONENTS:

| | | |
|---|---|---|
| Monitor Motorola | XM501-10B | Table |
| | XM701-10B | Upright |

Tapedeck Clarion 809 Cassette

| | |
|---|---|
| Power Supply | Internal on PCB with external multitap transformer |
| Logic PCB | 84 IC's<br>3 Regulators<br>6 Transistors<br>6 Diodes |
| Keyboards | 8 IC's<br>1 Transistor<br>2 Diodes |

MAINTENANCE AND ADJUSTMENTS:

PCB: No adjustments or maintenance necessary

KEYBOARDS: No adjustments or maintenance necessary

POWER SUPPLY: No adjustments or maintenance necessary

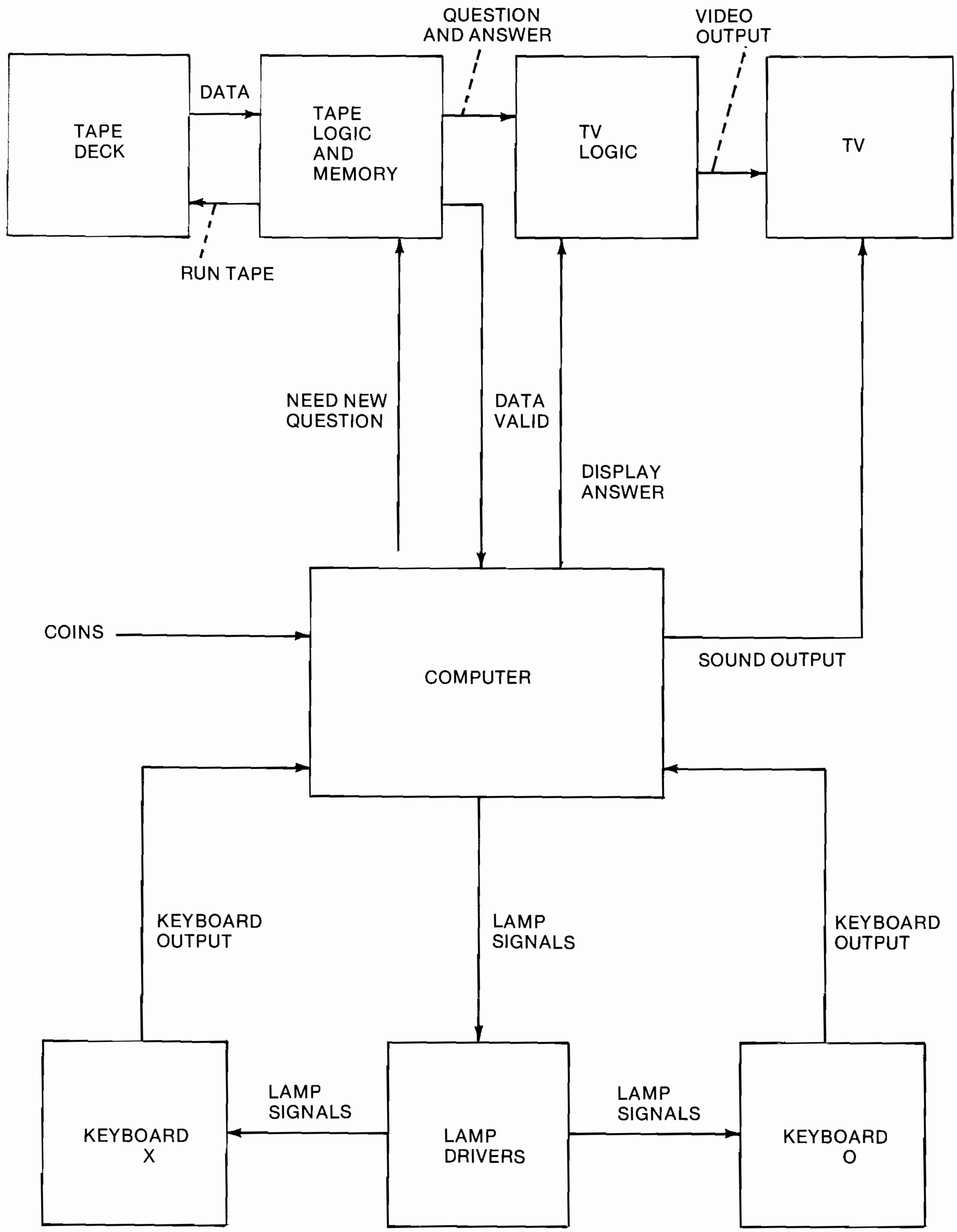
MONITOR: No maintenance necessary.

ADJUSTMENTS:
- Volume — Max.
- Brightness — Max.
- Contrast — Minimum acceptable to avoid "Bleeding".
- Horizontal Sync — Varies with temp — should be adjusted when game has been on for sometime and has come up to operation temp.

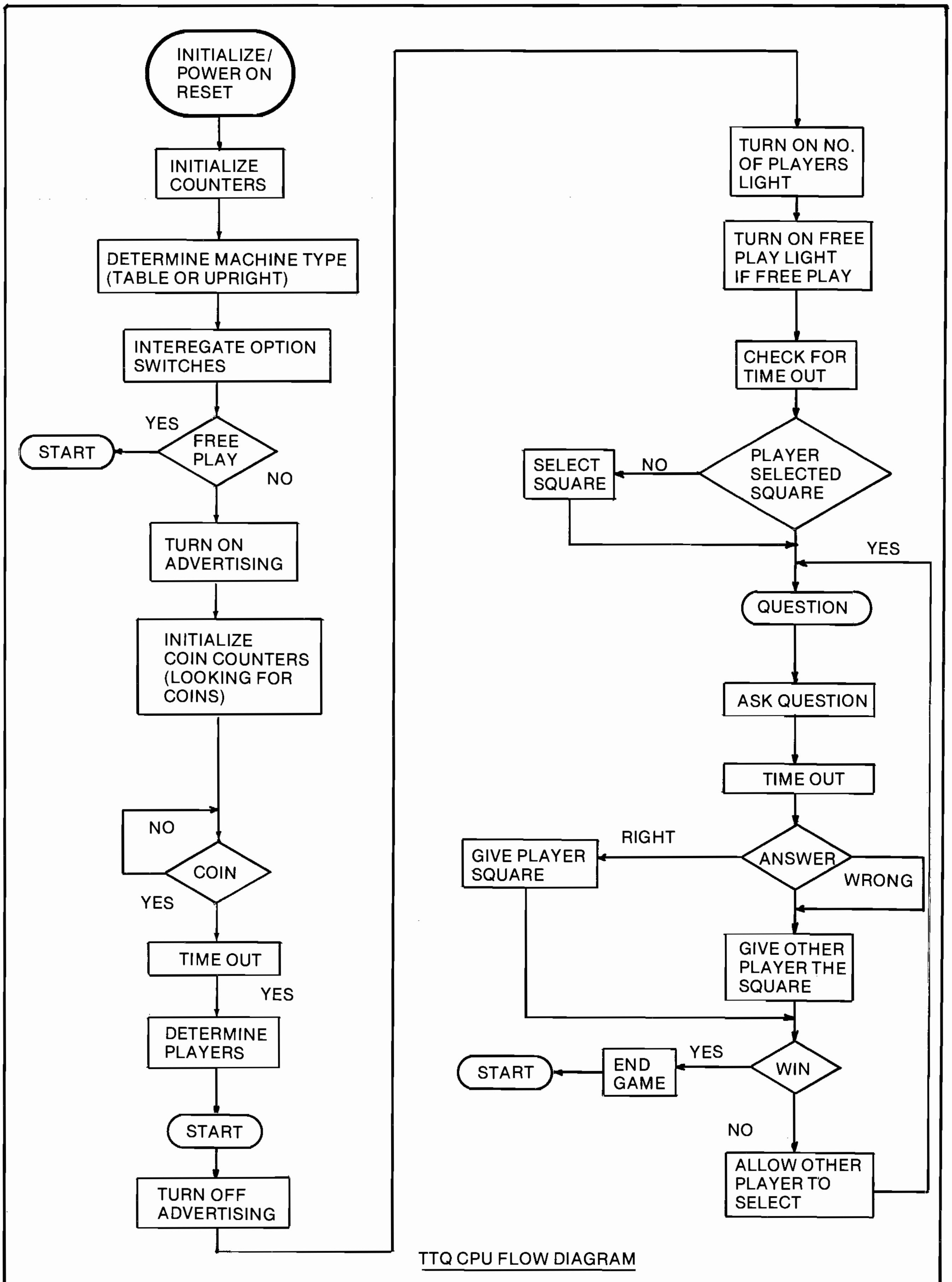
All adjustments located on rear of monitor.

TAPE DECK: No adjustments — all controls should be locked in the center positions.

MAINTENANCE: Remove the tape cassette and clean the play back heads with a cotton swab dipped in alcohol each time the coin box is emptied.
CAUTION — Keep any metal away from the playback heads.
If the heads are dirty the game will be slow to pickup the next question and complaints will result.




BLOCK DIAGRAM — TTQ




TTQ CPU FLOW DIAGRAM

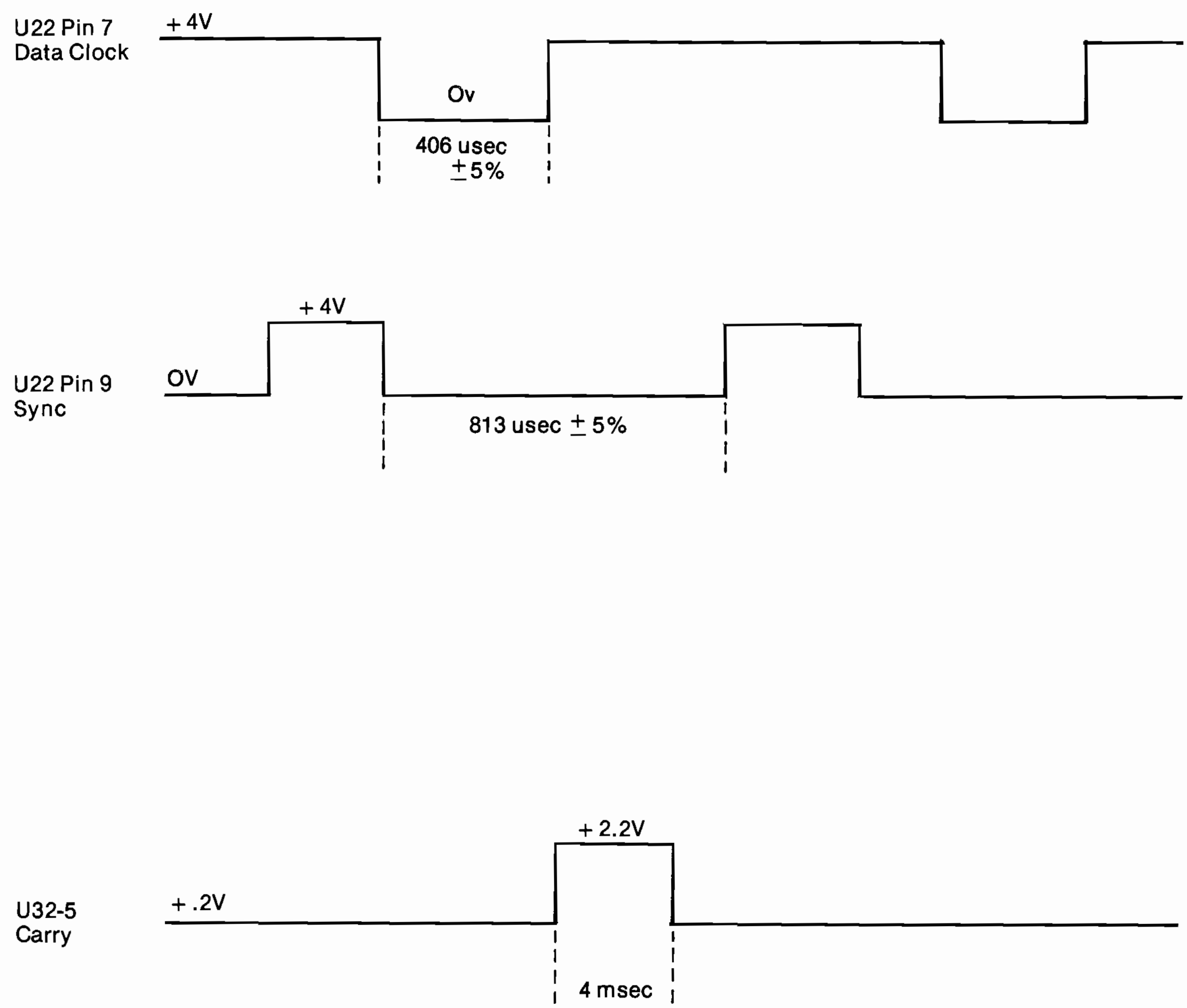
# TTQ TEST PROCEDURE
## LOGIC BOARD

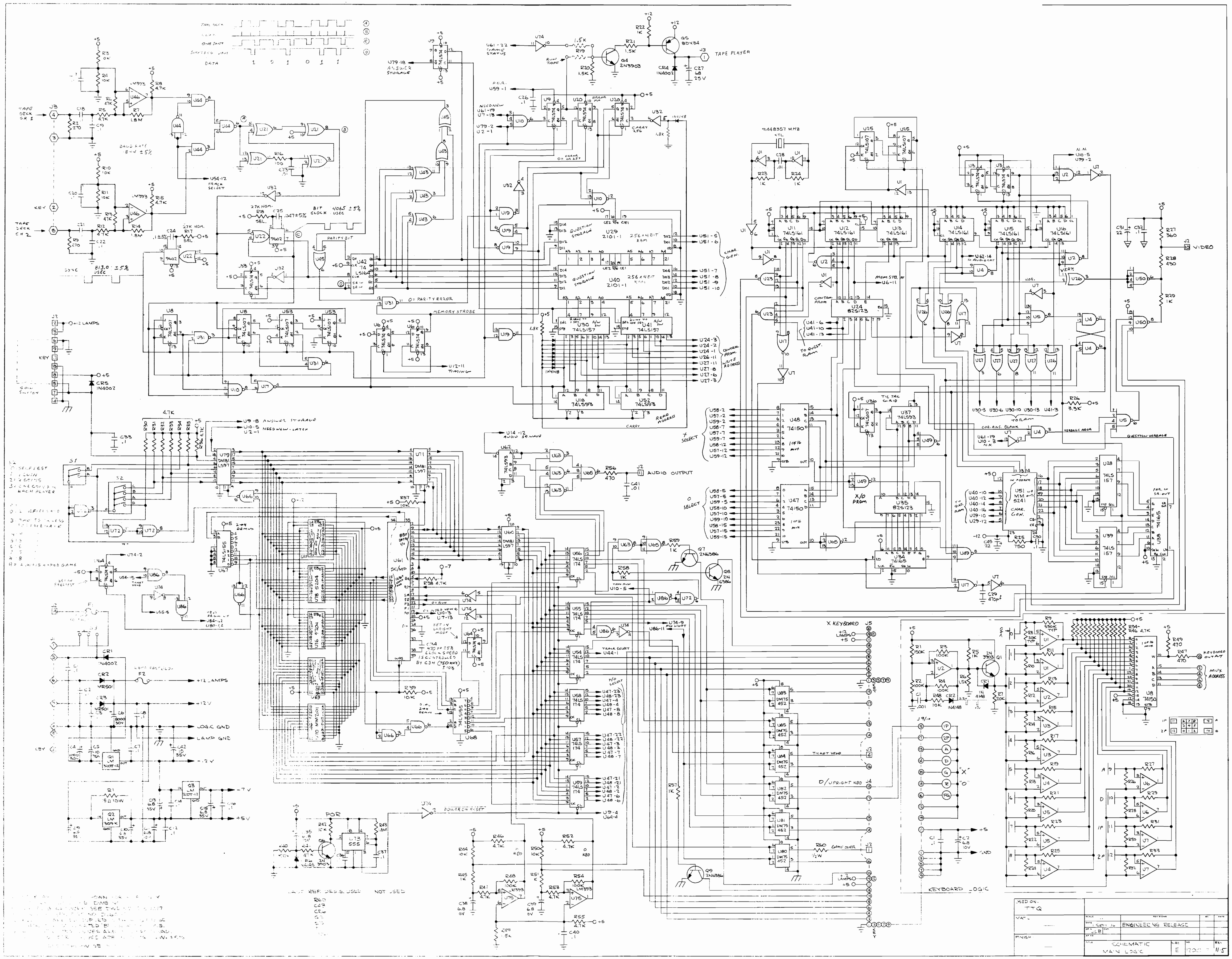
1. Turn variac to zero.
2. Connect JI, J2, J3.
3. Turn on the AC power switch.
4. Increase voltage with variac slowly while observing television display. The hum bars should go away after reaching 75 volts.
5. Check the - 7 volt + 5 volt and -12 volt power supply voltages at Q1.
6. Check and trim the data clock at U22 Pin 7. (See page 9)
7. Check and trim the sync pulse at U22 Pin 9. (See page 9)
8. Check the address counter carry signal at U32 Pin 5. (See page 9)
9. Observe test characters for missing or extra dots.
10. Remove power and install U61, U76, U77, U78.
11. Plug in both keyboards, set S2 to 0.
12. Test all keys on the X keyboard, check all lamps and sounds.
13. Disconnect X keyboard.
14. Check all keys, lamps and sounds with the O keyboard.
15. Check all X and O positions on the television grid. Check all lamps, keys and sounds for the O keyboard.
16. Test the cabinet light hi and low switch.
17. Set S2 to 1 and check for single coin operation and observe operation of the coin counter lamp.
18. Set S2 to 2 and check two coin operation.
19. Set S2 to 3 and check for single coin and two coin play.
20. Set S2 to 1.
21. Set S3 to 4 and play a single player game to win in four moves. A credit indication and one free game should result.
22. Set S3 to 3 and play a single player game to win in three moves. A credit indication and one free game should result.
23. Set S3 to 9 and play a single player game to win in nine moves. A credit indication and one free game should result.
24. Check ticket vend at end of each game, the indicator lamp should light for .3 seconds at the end of each game.
25. Check coin light, it should be on at all times.
26. Check game over lamp, it should be on in standby.
27. Check CPU master clock frequency, it should be 750KHz ±10%.

## KEYBOARD

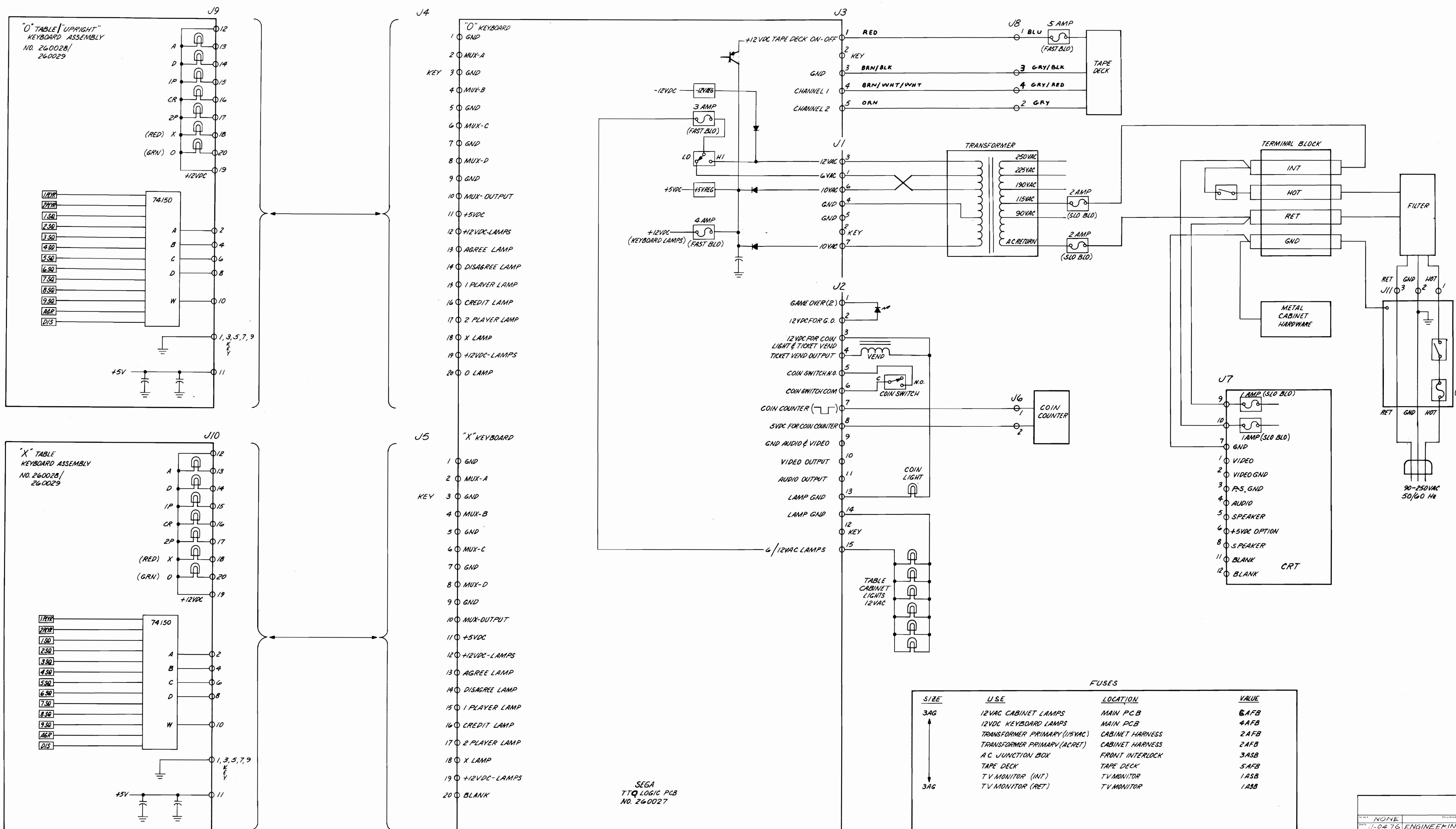
1. Connect keyboard under test to a known good logic board. Set S2 to 0.
2. Place a keyboard glass over the keys.
3. Ground one end of a 240,000 ohm resistor with a test lead.
4. Touch the free end of the resistor to each key and note that the proper square is selected on the television. Check all lamps and be sure the red and green filters are properly placed.

# TIMING CHART





TAPE PLAYER
VIDEO
AUDIO OUTPUT
X KEYBOARD
KEYBOARD LOGIC
POR
QUESTION STORAGE
CHAR GEN.
X/O PROM
TICKET VEND
D/UPRIGHT KBD
GAME OVER
+12 LAMPS
+12V
LOGIC GND
LAMP GND
-7V
+5V
USED ON:
TTQ
MAT'L
FINISH
SCALE
REVISIONS
BY
DATE
DATE 1 SEPT 76
ENGINEERING RELEASE
DR'N JLB
CHK'D
AP'VD
TITLE
SCHEMATIC
MAIN LOGIC
SIZE E
REV 11-5




FUSES

| SIZE | USE | LOCATION | VALUE |
|---|---|---|---|
| 3AG | 12VAC CABINET LAMPS | MAIN PCB | 6AFB |
| ↑ | 12VDC KEYBOARD LAMPS | MAIN PCB | 4AFB |
| | TRANSFORMER PRIMARY (115VAC) | CABINET HARNESS | 2AFB |
| | TRANSFORMER PRIMARV (ACRET) | CABINET HARNESS | 2AFB |
| | A C JUNCTION BOX | FRONT INTERLOCK | 3ASB |
| | TAPE DECK | TAPE DECK | 5AFB |
| ↓ | TV MONITOR (INT) | TV MONITOR | 1ASB |
| 3AG | TV MONITOR (RET) | TV MONITOR | 1ASB |

| | | | |
|---|---|---|---|
| SCALE NONE | REVISIONS | BY | DATE |
| DATE 11-04 76 | ENGINEERING RELEASE | | 126 |
| DRN L M | CKD | | |
| TITLE TTQ CABINET WIRING | SIZE F | NO 120044 | REV |